REPORT DOCUMENTATION PAGE

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE August 1995	3. REPORT TYPE AND DATES COVERED Final Report 5/1/92-4/30/94

4. TITLE AND SUBTITLE	5. FUNDING NUMBERS
Workshop in Computational Neuroscience	G: N00014-92-J-1442

6. AUTHOR(S)

Dr. Terrence J. Sejnowski

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
Marine Biological Laboratory 7 MBL Street Woods Hole, MA 02543	none

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSORING/MONITORING AGENCY REPORT NUMBER
Department of the Navy Office of The Chief of Naval Research 800 North Quincy Street Arlington, VA 22217-5660	

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE
Approved for public release; distribution is unlimited	

13. ABSTRACT (Maximum 200 words)

The Woods Hole Workshop on Computational Neuroscience at the Marine Biological Laboratory was held for one week each August in 1992 to 1994. Each year, twenty investigators who are concerned with the computational functions of nervous systems had intense discussion on a wide range of topics in computational neuroscience, including neural mechanisms for computation, neural systems for long-term memory, neural decisions, and active perception. In addition, some members of the workshop lectured in the concurrent Computational Neuroscience Course at MBL, and students were invited to attend the workshop.

14. SUBJECT TERMS			15. NUMBER OF PAGES 15
nervous systems; memory; perception; neural coding			16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL

GENERAL INSTRUCTIONS FOR COMPLETING SF 298

The Report Documentation Page (RDP) is used in announcing and cataloging reports. It is important that this information be consistent with the rest of the report, particularly the cover and title page. Instructions for filling in each block of the form follow. It is important to *stay within the lines* to meet *optical scanning requirements*.

Block 1. Agency Use Only *(Leave blank)*.

Block 2. Report Date. Full publication date including day, month, and year, if available (e.g. 1 Jan 88). Must cite at least the year.

Block 3. Type of Report and Dates Covered. State whether report is interim, final, etc. If applicable, enter inclusive report dates (e.g. 10 Jun 87 - 30 Jun 88).

Block 4. Title and Subtitle. A title is taken from the part of the report that provides the most meaningful and complete information. When a report is prepared in more than one volume, repeat the primary title, add volume number, and include subtitle for the specific volume. On classified documents enter the title classification in parentheses.

Block 5. Funding Numbers. To include contract and grant numbers; may include program element number(s), project number(s), task number(s), and work unit number(s). Use the following labels:

C	-	Contract	**PR** -	Project
G	-	Grant	**TA** -	Task
PE	-	Program Element	**WU** -	Work Unit Accession No.

Block 6. Author(s). Name(s) of person(s) responsible for writing the report, performing the research, or credited with the content of the report. If editor or compiler, this should follow the name(s).

Block 7. Performing Organization Name(s) and Address(es). Self-explanatory.

Block 8. Performing Organization Report Number. Enter the unique alphanumeric report number(s) assigned by the organization performing the report.

Block 9. Sponsoring/Monitoring Agency Name(s) and Address(es). Self-explanatory.

Block 10. Sponsoring/Monitoring Agency Report Number. *(If known)*

Block 11. Supplementary Notes. Enter information not included elsewhere such as: Prepared in cooperation with...; Trans. of...; To be published in.... When a report is revised, include a statement whether the new report supersedes or supplements the older report.

Block 12a. Distribution/Availability Statement. Denotes public availability or limitations. Cite any availability to the public. Enter additional limitations or special markings in all capitals (e.g. NOFORN, REL, ITAR).

- **DOD** - See DoDD 5230.24, "Distribution Statements on Technical Documents."
- **DOE** - See authorities.
- **NASA** - See Handbook NHB 2200.2.
- **NTIS** - Leave blank.

Block 12b. Distribution Code.

- **DOD** - Leave blank.
- **DOE** - Enter DOE distribution categories from the Standard Distribution for Unclassified Scientific and Technical Reports.
- **NASA** - Leave blank.
- **NTIS** - Leave blank.

Block 13. Abstract. Include a brief *(Maximum 200 words)* factual summary of the most significant information contained in the report.

Block 14. Subject Terms. Keywords or phrases identifying major subjects in the report.

Block 15. Number of Pages. Enter the total number of pages.

Block 16. Price Code. Enter appropriate price code *(NTIS only)*.

Blocks 17. - 19. Security Classifications. Self-explanatory. Enter U.S. Security Classification in accordance with U.S. Security Regulations (i.e., UNCLASSIFIED). If form contains classified information, stamp classification on the top and bottom of the page.

Block 20. Limitation of Abstract. This block must be completed to assign a limitation to the abstract. Enter either UL (unlimited) or SAR (same as report). An entry in this block is necessary if the abstract is to be limited. If blank, the abstract is assumed to be unlimited.

Terrence Sejnowski

FINAL REPORT

ONR Grant N00014-92-J-1442

Workshop in Computational Neuroscience

1992-1994

19960719 067

Summary

The Woods Hole Workshop on Computational Neuroscience at the Marine Biological Laboratory was held for one week each August in 1992 to 1994. Each year, twenty investigators who are concerned with the computational functions of nervous systems had intense discussion on a wide range of topics in computational neurosciewnce, including neural mechanisms for computation, neural systems for long-term memory, neural decisions, and active perception. In addition, some members of the workshop lectured in the concurrent Computational Neuroscience Course at MBL, and students were invited to attend the workshop.

Organization of the Workshop:

The Woods Hole Workshop on Computational Neuroscience at the Marine Biological Laboratory (MBL) was first held in 1984. Organized by Terrence Sejnowski, it brought together, for the first time, leading researchers from neuroscience and computer science who were concerned with understanding the computational resources of nervous systems. Since 1987, the workshop has been held in conjunction with the Summer Course on Computational Neuroscience at the Marine Biological Laboratory. The week-long workshop has been held during the last week of the month-long summer course, and members of the workshop serve as faculty for the students..

Each participant was allowed 90 minutes to present a new finding, including discussion. Two general sessions were held each day, one the morning from 9 AM to 12 Noon, and the second in the evening from 7 PM to 10 PM. Each sessions included two presentations, one from an experimentalist, and one from a theoretician. The afternoons were free to allow the participants to form small groups for lunch and other activities. These activities included interactions with the students in the summer course; a picnic organized by Robert Bosler, a resident of Woods Hole, and a student-faculty volleyball game. The special environment in Woods Hole, which is a major summer research center in neurobiology and has

great physical beauty, has given the workshops a perfect setting and created an ideal place for cross disciplinary interactions to occur.

The central themes of the three workshops that were held at the Marine Biological Laboratory from 1992 to 1994 were neural coding and dynamical information processing in large populations of neurons. A majority of the participants in these workshops were experts on visual processing, but selected sessions on auditory and olfactory coding were also highlighted. In the three years summarized here, a total of 60 researchers participated in the workshops (see appendix).

Neural mechanisms for computation. Each workshop included several talks that were concerned with the biophysical mechanisms that are responsible for information processing in neurons. For example, in 1994, two sessions were devoted to the information carried by single spikes (Sejnowski: spike initiation; Koch: spike timing in area MT; Bialek: adaptive temporal filtering in the fly motion processing system). The issue of temporal processing of information was also address in talk be Laurent, on the olfactory coding in the locust, and by Seung on the neural integrator in the oculomotor system.

Neural systems for long-term memory An important issue that arose in the 1994 workshop was the coding of space in the hippocampus (Wilson) and the learning mechanisms that might be responsible for forming new spatial representations (Abbott and Lisman). In addition, a modeling talk that explored the dynamics of attractor networks was presented that might account for new observations regarding the tendency for hippocampal neurons to form spatial clusters (Tsodyks). Tishby also presented an analysis of data from the visual cortex that indicated a similar tendency of cortical neurons to form temporal clusters during a delayed match-to-sample task.

Neural decisions. Over the last several years, recordings of single neurons from area MT have revealed that single neurons are capable of encoding sensory information with the same accuracy as the response of the monkey. In the best-studied perceptual task, the monkey is asked to decide on the direction of motion in a display of correlated randomly moving dots.. Shadlen showed, in recordings from the parietal region of the monkey cortex, that some neurons reliably encode the decision of the monkey. Maunsell and evidence Desimone also found evidence for decision-related signals in other parts of the monkey's cortex during tasks that require short-term memory.

Active Perception. Animals are not passive observers, but actively interact with their environment. This is most clearly seen in observer self-motion (Royden) where visual cues in the motion flow field are used

to judge heading. Ballard has pioneered the theoretical study of active perception. At the workshop, he showed that humans favor strategies that rely on eye-movements rather than memory when given free choice in solving a copying task. This suggests that rather than create a detailed internal model of the outside visual world, the visual system instead creates simpler representations that fulfill immediate needs of the motor system when solving a task. Ballard also demonstrated the possibility of studying the performance of humans in complex tasks such driving suing recent advances in virtual reality.

Facilities at MBL

The Workshop was held at MBL because it has the highest concentration of neurobiologists during the summer of any institution in the world, and MBL offers the most advanced training in other aspects of neurobiology during the summer (Courses in Neurobiology, Neural Systems and Behavior, Cellular Neurobiology of the Leech, and Methods in Computational Neuroscience. The overall site is superb from the point of view of facilities (a 24 hour world-class library), location (90 minute drive from Boston), and amenities (restaurants, recreational facilities, computer access all within walking distance).

10th Annual Woods Hole Workshop on Computational Neuroscience

Marine Biological Laboratory
August 22 - August 28, 1994

Monday, August 22

Hippocampal Dynamics

7:00 p.m.	Matthew Wilson, University of Arizona
8:30 p.m.	Break
9:00 p.m.	Laurence Abbott, Brandeis University
10:30 p.m.	Beer and wine

Tuesday, August 23

Cortical Dynamics

9:00 a.m.	Mishail Tsodyks, Salk Institute
10:30 a.m.	Break
11:00 a.m.	Rodney Douglas, Oxford
12:30 p.m.	Lunch

Neural Assemblies

7:00 p.m.	Gilles Laurent, Caltech
8:30 p.m.	Break
9:00 p.m.	Naftali Tishby, Hebrew University
10:30 p.m.	Beer and wine

Wednesday, August 24

Visual Attending

9:00 a.m.	Alexander Pentland, MIT Media Lasboratory
10:30 a.m.	Break
11:00 a.m.	Robert Desimone, NIMH
12:30 p.m.	Lunch

Cortical Mechanisms

7:00 p.m.	David Kleinfeld, AT&T Bell Laboratories
8:30 p.m.	Break
9:00 p.m.	David Tank, AT&T Bell Laboratories
10:30 p.m.	Beer and wine

Thursday, August 25

Cortical Processing

9:00 a.m.	Steven Zucker, McGill University
10:30 a.m.	Break
11:00 a.m.	Allan Dobbins, Caltech
12:30 p.m.	Lunch

Active Vision

7:00 p.m.	Constance Royden, Wellesley College
8:30 p.m.	Break
9:00 p.m.	Dana Ballard, Rochester University
10:30 p.m.	Beer and Wine

Friday, August 26

Visual Decisions

9:00 a.m.	John Maunsell, Baylor College of Medicine
10:30 a.m.	Break
11:00 a.m.	Michael Shadlen, Stanford University
12:30 p.m.	Lunch

Neuronal Reliability

7:00 p.m.	Christof Koch, Caltech
8:30 p.m.	Break
9:00 p.m.	Terrence Sejnowski, Salk Institute
10:30 p.m.	Beer and wine

Saturday, August 27

Sensory Statistics

9:00 a.m.	Fabrizio Gabbiani, Caltech
10:30 a.m.	Break
11:00 a.m.	William Bialek, NEC Research
12:30 p.m.	Lunch
3:00 p.m.	Student Demonstrations
6:00 p.m.	Lobster Banquet

Woods Hole Workshop on
Computational Neuroscience - 1994
Marine Biological Laboratory

Participants

Dr. John Allman
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Dr. Laurence Abbott
Physics Department
Brandies University
South Street
Waltham, MA 02254

Dr. Dana Ballard
Department of Computer Science
University of Rochester
Rochester, NY 14627

Dr. William Bialek
NEC Research Institute
4 Independence Way
Princeton, NJ 08540

Dr. Linda Buck
Department of Neurobiology
Harvard Medical School
25 Shattuck Street
Boston, MA 02115

Dr. Joel Davis
Department of the Navy
Office of Naval Research
Arlington, VA 22217-5000

Dr. Robert Desimone
Lab Neuropsychology
NIMH - Bldg. 9, Rm. 1N107
Bethesda, MD 20892

Dr. Allan Dobbins
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Dr. Rodney Douglas
MRC Anatomical
Neuropharmacology Unit
Mansfield Road
Oxford, OX1 3TH, ENGLAND

Dr. Fabrizio Gabbiani
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Dr. David Kleinfeld
AT&T Bell Laboratories
Room 6H 424
600 Mountain Avenue
Murray Hill, NJ 07974

Dr. Christof Koch
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Dr. Gilles Laurent
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Dr. John Maunsell
Division of Neuroscience
Baylor College of Medicine
1 Baylor Plaza, S603
Houston, TX 77030

Dr. Thomas McKenna
Department of the Navy
Office of Naval Research
Arlington, VA 22217-5000

Dr. Alexander Pentland
Media Laboratory
MIT
Cambridge, MA 02139

MARINE   BIOLOGICAL   LABORATORY

WOODS   HOLE   ·   MASSACHUSETTS   ·   02543   ·   (508) 548-3705

**Office of Research Administration
and Educational Programs**

Direct Dial:	**(508) 289-7670**
Facsimile:	**(508) 457-1924**
e-mail:	**shunt@mbl.edu**

August 8, 1995

Scientific Officer Code: 1142BI
Joel L. Davis
Office of Naval Research
800 North Quincy Street
Arlington VA   22217-5000

Subj: Final Report

Ref: ONR Grant N00014-92-J-1442

Gentlemen:

On behalf of the Marine Biological Laboratory and the Principal
Investigator of the above-referenced grant, Dr. Terrence Sejnowski, I
enclose three copies of the final report for the "Workshop in
Computational Neuroscience".

Please contact this office if you have any questions or require
additional information.

Sincerely,

Sharon L. Hunt
Grants Assistant

Enclosures

Copy to: ONR Grant Administrator (1 copy)
          DTIC (1 copy)

Woods Hole Workshop on
Computational Neuroscience - 1994
Marine Biological Laboratory

Participants

Dr. Terrence J. Sejnowski
Computational Neurobiology Lab
The Salk Institute
P. O. Box 85800
San Diego, CA 92186

Dr. Stanzi Royden
Computer Science Dept.
Wellesley College
Wellesley, MA 02181

Dr. Michael Shadlen
Department of Neurobiology
Stanford Medical School
Stanford, CA 94395

Dr. David Tank
AT&T Bell Laboratories
Room 1C 427
600 Mountain Avenue
Murray Hill, NJ 07974

Dr. Naftali Tishby
Institute of Computer Science &
Center for Neural Computation
Hebrew University
Jerusalem, 91904
Israel

Dr. Misha Tsodyks
Computational Neurobiology Lab
The Salk Institute
P. O. Box 85800
San Diego, CA 92186

Dr. Matthew Wilson
Life Sciences Building
University of Arizona
Tucson, AZ 85724

Dr. Steven Zucker
Department of Electrical Engineering
McGill University
3480 University Street
Montreal, Quebec H3A 2

9th Annual Woods Hole Workshop on Computational Neuroscience

Marine Biological Laboratory
August 21 - August 27, 1993

Saturday, August 21

Reception

7:00 p.m.	Beer and wine

Sunday, August 22

Sensory Coding

9:00 a.m.	Linda Buck, Harvard School of Medicine
10:30 a.m.	Break
11:00 a.m.	William Bialek, NEC
12:30 p.m.	Lunch

Neural Assemblies

7:00 p.m.	Matthew Wilson, University of Arizona
8:30 p.m.	Break
9:00 p.m.	John Allman, Caltech
10:30 p.m.	Beer and wine

Monday, August 23

Visual Representations

9:00 a.m.	Michael Stryker, UC San Francisco
10:30 a.m.	Break
11:00 a.m.	Steven Zucker, McGill University
12:30 p.m.	Lunch

Memory Representations

7:00 p.m.	Robert Desimone, NIHM
8:30 p.m.	Break
9:00 p.m.	Dana Ballard, Rochester University
10:30 p.m.	Beer and wine

Tuesday, August 24

Cortical Microcircuits

9:00 a.m.	Rodney Douglas, Oxford University
10:30 a.m.	Break
11:00 a.m.	Douglas Miller, McGill University
12:30 p.m.	Lunch

Dendritic Processing

7:00 p.m.	David Tank, AT&T Bell Laboratories
8:30 p.m.	Break
9:00 p.m.	Christof Koch, Caltech
10:30 p.m.	Beer and Wine

Wednesday, August 25

Motion Processing

9:00 a.m.	Udi Zohary, Stanford Medical School
10:30 a.m.	Break
11:00 a.m.	Robert de Ruyter, NEC
12:30 p.m.	Lunch

Cortical Coding

7:00 p.m.	Pieter Roelfsema, Max-Planck, Frankfurt
8:30 p.m.	Break
9:00 p.m.	David Kleinfeld, AT&T Bell Laboratories
10:30 p.m.	Beer and wine

Thursday, August 26

Spatial Representations

9:00 a.m.	Apostolos Georgopoulos, University of Minnesota
10:30 a.m.	Break
11:00 a.m.	Richard Andersen, MIT/Caltech
12:30 p.m.	Lunch

Task-Dependent Processing

2:00 p.m.	John Maunsell, Baylor School of Medicine
3:30 p.m.	Break
4:00 p.m.	Terrence Sejnowski, Salk Institute/Caltech
5:30 p.m.	Dinner

Woods Hole Workshop on
Computational Neuroscience - 1993
Marine Biological Laboratory

Participants

Dr. John Allman
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Dr. Richard Andersen
Department of Brain
and Cognitive Science
MIT
Cambridge, MA 02139

Dr. Dana Ballard
Department of Computer Science
University of Rochester
Rochester, NY 14627

Dr. William Bialek
NEC Research Institute
4 Independence Way
Princeton, NJ 08540

Dr. Linda Buck
Department of Neurobiology
Harvard Medical School
25 Shattuck Street
Boston, MA 02115

Dr. Robert de Ruyter
NEC Research Institute
4 Independence Way
Princeton, NJ 08540

Dr. Joel Davis
Department of the Navy
Office of Naval Research
Arlington, VA 22217-5000

Dr. Robert Desimone
Lab Neuropsychology
NIMH - Bldg. 9, Rm. 1N107
Bethesda, MD 20892

Dr. Rodney Douglas
MRC Anatomical
Neuropharmacology Unit
Mansfield Road
Oxford, OX1 3TH, ENGLAND

Dr. Apostolos Georgopoulos
Brain Science Center
VA Medical Center
One Veterans Drive
Minneapolis, MN 55417

Dr. David Kleinfeld
AT&T Bell Laboratories
Room 6H 424
600 Mountain Avenue
Murray Hill, NJ 07974

Dr. Christof Koch
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Dr. John Maunsell
Division of Neuroscience
Baylor College of Medicine
1 Baylor Plaza, S603
Houston, TX 77030

Dr. Michale Fee
AT&T Bell Laboratories
Room 6H 424
600 Mountain Avenue
Murray Hill, NJ 07974

Woods Hole Workshop on
Computational Neuroscience - 1993
Marine Biological Laboratory

Participants

Dr. Douglas Miller
Department of Electrical
Engineering
McGill University
3480 University Street
Montreal, Quebec H3A 2

Dr. Thomas McKenna
Department of the Navy
Office of Naval Research
Arlington, VA 22217-5000

Dr. Pieter Roelfsema
Max Planck Institute
  for Brain Research
Postfach 71 06 62
Deutschordenstrasse 46
D-6000 Frankfurt, GERMANY

Dr. Terrence J. Sejnowski
Computational Neurobiology Lab
The Salk Institute
P. O. Box 85800
San Diego, CA 92186

Dr. Michael Stryker
Department of Physiology
University of California
School Of Medicine
San Francisco, CA 94143-0444

Dr. David Tank
AT&T Bell Laboratories
Room 1C 427
600 Mountain Avenue
Murray Hill, NJ 07974

Dr. Matthew Wilson
Life Sciences Building
University of Arizona
Tucson, AZ 85724

Dr. Udi Zohary
Department of Neurobiology
Stanford Medical School
Stanford, CA 94395

Dr. Steven Zucker
Department of Electrical
Engineering
McGill University
3480 University Street
Montreal, Quebec H3A 2

8th Annual Woods Hole Workshop on Computational Neuroscience

Marine Biological Laboratory
August 22 - August 28, 1992

Saturday, August 22

8:30 p.m.	Reception, Loeb 201

Sunday, August 23

Dynamic and Modular Vision

9:00 a.m.	Dan Ts'o, Rockefeller University
10:30 a.m.	Break
11:00 a.m.	Alexander Pentland, MIT Media Lab
12:30 p.m.	Lunch

Olfactory Coding

7:00 p.m.	John Kauer, Tufts University Medical School
8:30 p.m.	Break
9:00 p.m.	James Bower, Caltech
10:30 p.m.	Beer and wine

Monday, August 24

Olfactory Associations

9:00 a.m.	Lewis Haberly, University of Wisconsin
10:30 a.m.	Break
11:00 a.m.	Michael Hasselmo, Harvard
12:30 p.m.	Lunch

Beyond Single Units

7:00 p.m.	John Allman, Caltech
8:30 p.m.	Break
9:00 p.m.	David Tank, AT&T Bell Laboratories
10:30 p.m.	Beer and wine

Tuesday, August 25

Eye Movements

9:00 a.m.	Carol Colby, NIMH
10:30 a.m.	Break
11:00 a.m.	Dana Ballard, University of Rochester
12:30 p.m.	Lunch

Space and Time

7:00 p.m.	Richard Andersen, MIT
8:30 p.m.	Break
9:00 p.m.	David Kleinfeld, AT&T Bell Laboratories
10:30 p.m.	Beer and Wine

Wednesday, August 26

Cortical Circuitry

9:00 a.m.	Rodney Douglas, MRC Neuroanatomical Unit, Oxford
10:30 a.m.	Break
11:00 a.m.	A. B. Bonds, Vanderbilt University
12:30 p.m.	Lunch

Cortical Development

7:00 p.m.	Michael Stryker, UC San Francisco
8:30 p.m.	Break
9:00 p.m.	Terrence Sejnowski, Salk Institute/UC San Diego
10:30 p.m.	Beer and wine

Thursday, August 27

Cortical Architecture

9:00 a.m.	Gary Blasdel, Harvard
10:30 a.m.	Break
11:00 a.m.	Steven Zucker, McGill University
12:30 p.m.	Lunch

Cortical Coding

7:00 p.m.	Michael Shadlin, Stanford Medical School
8:30 p.m.	Break
9:00 p.m.	Christof Koch, Caltech
10:30 p.m.	Beer and wine

Woods Hole Workshop on
Computational Neuroscience - 1992
Marine Biological Laboratory

Participants

Dr. John Allman
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Dr. Richard Andersen
Department of Brain
and Cognitive Science
MIT
Cambridge, MA 02139

Dr. Dana Ballard
Department of Computer Science
University of Rochester
Rochester, NY 14627

Dr. Gary Blasdel
Department of Neurobiology
Harvard Medical School
25 Shattuck Street
Boston, MA 02115

Dr. A. B. Bonds
Department of Electrical Engineering
Vanderbilt University
Nashville, TN 37235

Dr. James Bower
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Dr. Peter Brotchie
Department of Brain
and Cognitive Science
MIT
Cambridge, MA 02139

Dr. Carol Colby
Lab Sensorimotor Res.
NIMH - Bldg. 10, Rm. 10C101
Bethesda, MD 20892

Dr. Joel Davis
Department of the Navy
Office of Naval Research
Arlington, VA 22217-5000

Dr. Rodney Douglas
MRC Anatomical
Neuropharmacology Unit
Mansfield Road
Oxford, OX1 3TH
England

Dr. Lewis Haberly
Department of Anatomy
University of Wisconsin
1255 Linden Dr.
Madison, WI 53706

Dr. Michael Hasselmo
Department of Psychology
William James Hall
Harvard University
33 Kirkland Street
Casmbridge, MA 02138

Dr. John Kauer
Department of Neurosurgery
Tufts University Medical School
NE Medical Center
750 Washington Street
Boston, MA 02111

Dr. David Kleinfeld
AT&T Bell Laboratories
Room 6H 424
600 Mountain Avenue
Murray Hill, NJ 07974

Dr. Christof Koch
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Woods Hole Workshop on
Computational Neuroscience - 1992
Marine Biological Laboratory

Participants

Mr. Mark O'Dell
Division of Biology 216-76
Caltech
Pasadena, CA 91125

Dr. Alexander Pentland
Media Laboratory
MIT
Cambridge, MA 02139

Dr. Ning Qian
Department of Brain
and Cognitive Science
MIT
Cambridge, MA 02139

Dr. Terrence J. Sejnowski
Computational Neurobiology Lab
The Salk Institute
P. O. Box 85800
San Diego, CA 92186

Dr. Michael Shadlin
Department of Neurobiology
Stanford Medical School
Stanford, CA 94395

Dr. Michael Stryker
Department of Physiology
University of California
School Of Medicine
San Francisco, CA 94143-0444

Dr. David Tank
AT&T Bell Laboratories
Room 1C 427
600 Mountain Avenue
Murray Hill, NJ 07974

Dr. Daniel Ts'o
Department of Neurobiology
Rockefeller University
Tower Building, Rm. 425
1230 York Avenue
New York, NY 10021

Dr. Steven Zucker
Department of Electrical Engineering
McGill University
3480 University Street
Montreal, Quebec H3A 2